Egger, J.M. 2015. Range extension and first Montana records for *Castilleja puberula* Rydb. (Orobanchaceae). Phytoneuron 2015-62: 1–8. Published 23 November 2015. ISSN 2153 733X

RANGE EXTENSION AND FIRST MONTANA RECORDS FOR *CASTILLEJA PUBERULA* RYDB. (OROBANCHACEAE)

J. MARK EGGER
Herbarium, Burke Museum of Natural History and Culture
University of Washington
Seattle, Washington 98195-5325
m.egger@comcast.net

ABSTRACT

Two recent collections of the rare plant species *Castilleja puberula* Rydb. are reported for Montana. These records document a wide disjunction in and extension of the range of *C. puberula*, which was previously known only from 6 counties in the Rocky Mountains of north-central Colorado.

This paper reports a substantial disjunction in and extension for the range of the rare plant species *Castilleja puberula* Rydb. Until recently, *C. puberula* was only known from alpine plant communities in the Rocky Mountains of north-central Colorado, in Boulder, Clear Creek, Gilpin, Grand, Larimer, and Park counties (Ackerfield 2015; Colorado Rare Plant Technical Committee 2015; Hartman & Nelson 2001; Weber & Wittman 2012), and it was regarded as endemic to Colorado (J. Ackerfield, pers. comm. 2015). *Castilleja puberula* is a listed species of management concern, both in Colorado, where it is listed as S2-S3, as well as globally as G2-G3 (Colorado Rare Plant Technical Committee 2015).

In late 2014, Dick Olmstead (WTU) shared some photos he obtained of an unusual *Castilleja* species he collected in August 2014 near the summit of Mount Jefferson, a peak on the Continental Divide in the Centennial Range in Beaverhead Co., southwestern Montana, and close to the border of Fremont Co., Idaho (Figs. 1-2). It was quickly evident that these plants were unlike the usual *Castilleja* species known from Montana and they most closely resembled *C. puberula*. While searching the web site of the Consortium of Pacific Northwest Herbaria for similar plants, Olmstead noted a collection ten years earlier of a similar species from virtually the same location by Montana botanist Peter Lesica, a sheet of which was obtained on loan from MONTU. Lesica's collection was initially identified as *C. flava* S. Wats., a similar but considerably taller species found primarily in sagebrush habitats at moderate elevations, though a later annotation by Lesica linked his collection to *C. nivea* Pennell & M. Ownbey, another yellowish alpine *Castilleja* known from several mountain ranges in Montana and adjacent Wyoming. However, *C. nivea* has calyces divided into four subequal lobes, whereas the Mount Jefferson plants have calyces divided deeply in the adaxial-abaxial plane but cleft much more shallowly in the lateral plane.

Subsequent examination of both the Olmstead (Figs. 3-4) and Lesica (Figs. 5-6) collections and comparison with collections of *Castilleja puberula* from Colorado allowed positive identification of the Montana plants as belonging to that species. Specimen citations are provided below.

Montana. Beaverhead Co.: Centennial Range, common in stony limestone soil just below the summit of Mount Jefferson, T15S R2E S5, 10,150 ft, with *Dryas octopetala* and *Silene acaulis*, 16 Jul 2004, *Lesica 8884* (MONTU, NY); alpine meadows on upper slopes of Mount Jefferson, 44.56157° N, 111.50415° W, in rocky alpine meadow, 3090 m, plants circa 15 cm tall, flowers yellow, 19 Aug 2014, *Olmstead 2014-132* (ID, WTU). Figure 7 shows the locality.

These collections of *Castilleja puberula* are the fist and second for Montana and also represent the first known occurrence of this species outside of Colorado. This population represents a disjunction of approximately 600 km from the nearest populations in Colorado. Plants of the Montana

population are remarkably similar to the Colorado plants and show little, if any, morphological divergence. The large gap between the Colorado and Montana populations is difficult to explain, and *C. puberula* should be looked for in similar limestone alpine situations in the intervening mountains, especially in Wyoming.

ACKNOWLEDGEMENTS

I thank David Giblin (WTU) and Peter Lesica (MONTU) for assistance with loans and Maria Yousoufian (WTU) for imaging the herbarium specimens. My sincere gratitude is also extended to Richard Olmstead (WTU) and Peter Lesica for sharing their collections and photographs of live plants and for their reviews of an earlier draft of this paper. Finally, Jennifer Ackerfield (CS) generously provided timely information about the present status of *Castilleja puberula* in Colorado.

LITERATURE CITED

Ackerfield, J. 2015. Flora of Colorado. Botanical Research Institute of Texas, Fort Worth.

Colorado Rare Plant Technical Committee. 2015. Colorado Rare Plant Guide. Colorado Natural Heritage Program. <http://www.cnhp.colostate.edu/download/projects/rareplants/guide.asp?id= 17753> Accessed 9 Aug 2015

Hartman, R.L. and B.E. Nelson. 2001. A Checklist of the Vascular Plants of Colorado. Rocky Mountain Herbarium, Univ. of Wyoming, Laramie.

Weber, W.A. and R.C. Wittmann. 2012. Colorado Flora, Eastern Slope: A Field Guide to the Vascular Plants (ed. 4). University Press of Colorado, Boulder.

Figure 1. *Castilleja puberula* at the collection site on Mount Jefferson, *Olmstead 2014-132* (WTU), second collection for Montana. Photo by R.G. Olmstead.

Figure 2. *Castilleja puberula* at the collection site, *Olmstead 2014-132* (WTU). Photo by R.G. Olmstead.

inches
0 1 2 3 4
Burke
WTU HERBARIUM
UNIVERSITY of WASHINGTON
cm
0 1 2 3 4 5 6 7 8 9 10
copyright reserved
400979
UNIVERSITY OF WASHINGTON
U. Washington Herbarium (WTU)
WTU-V-007919
Plants of Montana
Castilleja puberula Rydb.
Det. by Mark Egger, 11 Jan 2015
(Orobanchaceae)
U.S.A., Montana, Beaverhead County:
Centennial Range; alpine meadows on upper slopes of Mount Jefferson. Elevation 3,090 m.
44.56157° N, 111.50415° W
Growing in rocky alpine meadow. Plants circa 15 centimeters; flowers yellow. Widely disjunct, new state record.
Richard G. Olmstead 2014-132
19 Aug 2014

Figure 3. Full sheet of *Olmstead 2014-132* (WTU).

Figure 4. Cropped specimens from *Olmstead 2014-132* (WTU).

Sp 32815
Castilleja puberula Rydb.
Determined by M. EGGER, 2/6/2015
at the University of Washington.
1ST RECORD FOR MONTANA!
Castilleja nivea Pennell & Owenby
Determined by P. Lesica 10-07
X
0 1 2 3 4 5 6 7 8 9 10
cm
BURKE WTU HERBARILM
BURKE MUSEUM
UNIVERSITY of WASHINGTON
copyright reserved
PLANTS OF MONTANA
Centennial Range Beaverhead Co.
Castilleja flava Wats.
Common in stony limestone soil just below the summit of Mount Jefferson. 10,150 ft. T15S R2E S5.
With Dryas octopetala and Silene acaulis.
16 July 2004 #8884
Collected by Peter Lesica
HERBARIUM
129983
UNIVERSITY OF MONTANA

Figure 5. Full sheet of *Lesica 8884* (MONTU), first collection of *Castilleja puberula* in Montana.

Figure 6. Cropped specimens from *Lesica 8884* (MONTU).

Figure 7. Habitat of *Castilleja puberula* near summit of Mount Jefferson, Beaverhead Co., Montana — site of both collections cited here as range extensions. The relatively flat-topped peak in the middle distance is Sawtell Peak, with the Yellowstone Plateau in the background. Photo by R.G. Olmstead.